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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,512	02/28/2001	Max Zellner	P-00,1992	1546

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EXAMINER

HARAN, JOHN T

ART UNIT	PAPER NUMBER
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1733

10

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/786,512

Applicant(s)

ZELLNER ET AL.

Examiner

John T. Haran

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-- The MAILING DATE of this communication appears in the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-17 and 21-26 is/are rejected.
- 7) ☒ Claim(s) 18-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the amendment filed on 1/2/03. All previous rejections are withdrawn in light of the amendment to the claims and Applicant's arguments.

Claim Objections

2. Claim 14 is objected to because of the following informalities: the word "form" should read - - from - - in line 7. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 14-17 and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lake et al (U.S. Patent 5,972,152) in view of Zhang et al (U.S. Patent 6,391,220) and Tanaka (U.S. Patent 5,909,009).

Lake et al is directed to a method of making a flexible circuit wherein a flexible circuit substrate of a flexible organic base layer material, such as polyimide, is attached to a rigid temporary support (auxiliary bearer), such as a glass processing carrier, via an adhesive film while integrated circuitry (flexible metallic fine structure) is patterned on the base layer (Column 2, lines 10-18; Column 3, lines 18-37; Column 4, lines 34-55; and Column 5, lines 40-43). Lake et al is silent toward detaching the finished flexible

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circuit from the temporary support by projecting laser radiation from a laser through the temporary support onto the base layer.

It is well known and conventional in the art when forming a flexible circuit to attach the flexible circuit substrate (base layer) to a rigid temporary support (auxiliary bearer) in order to process the base layer and detaching the flexible circuit once conductive patterns (flexible metallic fine structures) are formed on the base layer, as shown for example in Lake et al and Zhang et al (See Column 1, lines 27-45). It is also well known and conventional that numerous methods are available to detach the base layer from the auxiliary barrier such as forming a release layer, wet etching, and laser ablation, as taught for example in Zhang et al (See Column 6, lines 35-37). One skilled in the art would have readily appreciated using a known method, such as laser ablation, for detaching a base layer from an auxiliary bearer. Tanaka teaches that such laser ablation methods involve detaching a base layer of polyimide from an auxiliary bearer by projecting laser radiation from a laser through the auxiliary bearer onto the base layer (See Figures 19 and 20; Column 4, lines 52-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to detach the base layer from the auxiliary bearer by projecting laser radiation through the auxiliary bearer onto the base layer in the method of Lake et al, as suggested in Zhang et al and Tanaka.

Regarding claims 15 and 16, Tanaka teaches using quartz glass as the auxiliary bearer, however one skilled in the art would have readily appreciated that borosilicate glass also shares the same desired properties of the auxiliary bearer, a glass material

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that is transparent and that will transmit the laser radiation to the base layer. One skilled in the art would have readily appreciated that the particular wavelengths of the laser radiation would have depended on the materials worked upon. It would have been obvious to use the claimed materials for the auxiliary bearer and the claimed laser wavelengths in the method of Lake et al, as modified above.

Regarding claim 17, one skilled in the art would have readily appreciated applying adhesive to the auxiliary bearer in order to laminate the base layer to the auxiliary bearer to ensure the base layer stays flat and rigid during processing. It would have been obvious to apply an adhesive layer in the method of Lake et al, as modified above.

Regarding claims 21 and 22, Lake et al teach applying the base layer as a film of polyimide.

Regarding claims 23 and 26, one skilled in the art would have appreciated applying various insulating layers in the construction in order to insulate the metallic fine structures from one another. It would have been obvious to do so in the method of Lake et al, as modified above.

Regarding claims 24 and 25, applying several layers of metallic fine structures with insulating layers inbetween and via holes to interconnect the layers of metallic fine structures are well known and conventional in the art, as shown for example in Zhang et al (See Figure 5). It would have been obvious to do so in the method of Lake et al, as modified above.

Allowable Subject Matter

5. Claims 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. It is suggested to amend claim 14 to read:

14. A method for manufacturing a flexible circuit comprising:
providing an auxiliary bearer made of a material that is substantially transparent to laser radiation;

applying a layer of titanium onto the auxiliary bearer;
laminating a base layer of flexible organic material to the auxiliary bearer via the titanium layer;

producing a flexible metallic fine structure on the base layer to form a flexible circuit; and

detaching the base layer from the auxiliary bearer by projecting laser radiation from a laser through the auxiliary bearer and titanium layer onto the base layer.

7. Claims 17, 18, and 19 should be cancelled.

8. Claim 20 should be amended to read:

20. A method according to claim 14, wherein the titanium layer is applied by sputtering.

9. The following is a statement of reasons for the indication of allowable subject matter:

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The prior art of record fails to suggest a method of making a flexible circuit comprising **laminating** a base layer of flexible organic material to an auxiliary bearer substantially transparent to laser radiation **via a titanium layer**; producing flexible metallic fine structures on the base layer; and **detaching** the base layer from the auxiliary bearer by **projecting laser radiation from a laser through the auxiliary bearer and titanium layer onto the base layer**.

There is no suggestion in Lake et al, Zhang et al, or Tanaka to use a titanium layer to attach a flexible organic base layer to an auxiliary bearer.

Response to Arguments

10. Applicant's arguments with respect to claims 14-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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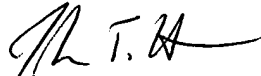
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(703) 305-0052**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-

0661.



John T. Haran

March 19, 2003



Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700